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Replacing a Bad Power Steering Pump



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Photograph by James Westman

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DEGREE OF DIFFICULTY

 **DIFFICULT**

Your spouse has been complaining about the minivan being hard to steer. Time to pick up a bottle of power steering oil on the way home. After you add the fluid, though, you notice a puddle of something under the engine. Within a minute of idling, the puddle is bigger by almost exactly 1 pint of power steering fluid. An odd coincidence, indeed. Checking the pump--which is buried well under the engine--reveals a lot of wet, oily stuff in the vicinity. Out come the ramps, and the minivan goes up in the air.

If you're lucky, you'll just have to replace a cut rubber hose or kinked steel line. But if it's not your day, you likely have a defective power steering pump. Red or oily stains in the driveway or garage--under an area where the transmission isn't--may also be a clue to a leak that's slowly robbing your hydraulic assist. (For more on diagnosing stains, click [here](#).)

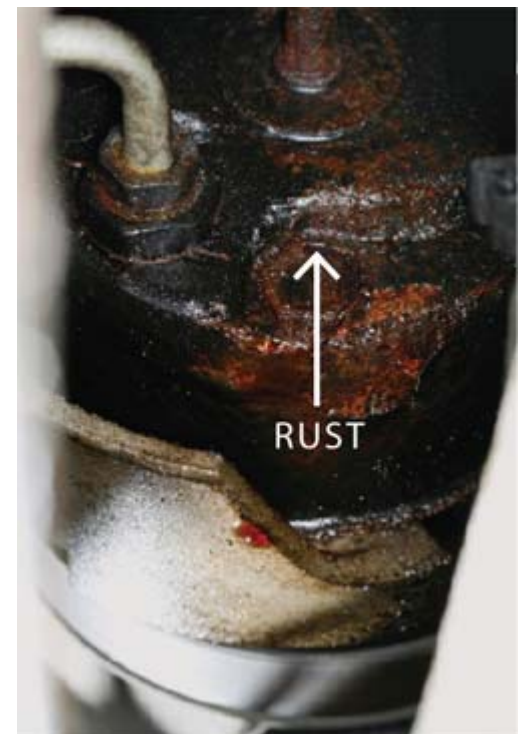
Everybody Has One

If you've never had to wrestle with your steering wheel, you've never driven a vehicle made before, say, the '70s oil crisis. Except for a few late-model cars that use electrically powered steering racks, virtually all cars and trucks on the road today have power-assisted steering. The pump provides hydraulic boost to the steering gear (the mechanism that actually pivots the front wheels) to reduce the driver's turning effort at the wheel.

When this system isn't working properly, every parking maneuver can become an upper-body workout or an ear-piercing underhood concerto. (We'll get to the noise part in a minute.) At road speeds, however, everything will seem pretty normal. Rolling front tires offer negligible resistance to turning, and the power steering system is under little load. At parking-maneuver speed, you need substantial hydraulic boost to spin the steering wheel.

What's the Problem?

While the trouble may stem from any number of things, including the steering gear itself, it's most likely an issue with the pump or a slow leak in its associated plumbing. Think about it. If a hose or line has a leak so big that it's reducing pressure to the steering gear, you would have known about it right away. You could have starred on the morning news as the guy who caused a 10-car pileup when



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The leak in this pump is from rusted-through sheetmetal housing. Usual leakage mode is shaft seal or hoses.

the high-pressure hose burst and dumped greasy fluid all over an interstate off ramp.

No, you have a more subtle symptom. These belt-driven pumps normally wear out from a low fluid level (caused by that slow leak), contaminated or improper fluid (possibly caused by an overzealous service station jockey), or just age.

A Moose in Heat

A power steering system that is in trouble often informs you of the problem by screaming for help, literally. Whenever the pump gets over-loaded, it emits a high-pitched squeal that sounds something like a moose in heat. Rotate your steering wheel to its end stops for a demonstration. The noise is normal then. But if you hear that sound under any other condition, it means the pump is under load when it shouldn't be or the system has leaked enough fluid that the pump is running dry. So check the power steering fluid level first. If the noise goes away after filling the reservoir to the proper level, you have a leak somewhere. The system won't lose fluid if it's working properly.

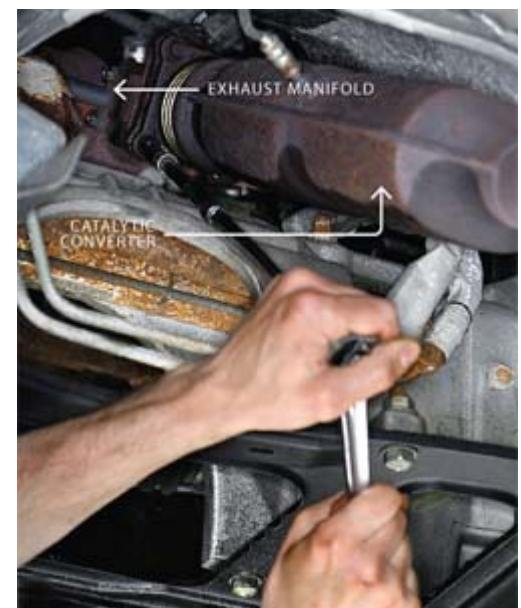
Squealing sounds? As long as you're under the vehicle, check the pump's belt for proper tension as well as wear



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Tight quarters around belt (seen here from underneath) make the simple task of swapping the pump a big puzzle. Remove the serpentine belt first.

and tear. Many engines today use a single serpentine belt to drive all the accessories. If it fails, you'll have more than just power steering trouble. So make sure the serpentine is riding the power steering pump's pulley on the straight and narrow. Some pulleys are plastic, most metal. Regardless, eye it to be sure it's running true.



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Rusty bolts holding catalytic converter to manifold had to be broken off after they refused to budge. Use fresh bolts, nuts and gasket for reassembly.

Replacing the Pump

Power steering pumps are not a DIY rebuild item. A bad pump is replaced, usually with one that's been professionally refurbished. You may be charged a deposit, commonly called a core charge, when you pick up the new pump. You'll get that back when you bring in the old pump for rebuild. Older cars' systems were happy with generic automatic transmission fluid. These days, though, check your owner's manual and the service literature for your specific vehicle at alldatadiy.com to find out exactly what fluid your car or truck manufacturer recommends. Using the wrong fluid could mean doing the whole job over again in a few months.

Where Is It?

The first step in replacing the pump is finding it. Don't laugh. Its exact location under the hood depends on many factors. What kind of engine is it--inline or V? Is the engine mounted transversely or longitudinally? Is the fluid reservoir mounted remotely or is it integral with the pump? The pump will be somewhere on the front of the engine with the other accessories. On the typical GM longitudinally mounted V8, for example, the power steering pump will be right behind the radiator (though not necessarily up high and within easy reach). The car seen here is a front-wheel-drive Chrysler-built minivan with a 3.3-liter V6.

Doing the Switch

To swap out your power steering pump, you should need only basic hand tools. However, some special flare-nut wrenches and a special tool to safely remove the pulley from the pulley shaft will make the job easier. These usually can be rented--even borrowed--from the auto parts store that sells you the replacement pump.

First, remove the drive belt(s) and take a close look--replace them if they're damaged or oil-soaked. Undo the high- and low-pressure lines from the pump body (and the reservoir hose if the fluid reservoir is mounted remotely). Have a catch pan handy for the fluid that will drip. As service manuals often say, "Reverse procedure to install replacement."

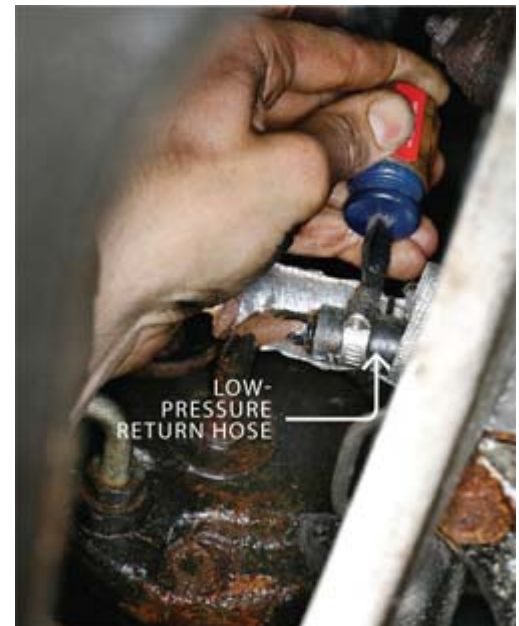
Of course, life in the real world is often nothing like life as described in a shop manual. For instance, on our minivan, the pump can be removed and installed only one way--from below. That's because it's mounted all the way at the bottom of the engine and up against the firewall. Wait, it gets worse. To get the pump out, we had to unbolt the exhaust pipe from its flange and move it aside. This is about as extreme as any power steering pump replacement can get, so yours will definitely be easier.

After the new pump is in, belt reinstalled and tensioned, refill the system with the correct fluid. Then--preferably with the front



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A flare-nut wrench does a better job of not rounding off fitting on hydraulic line than ordinary open-end.

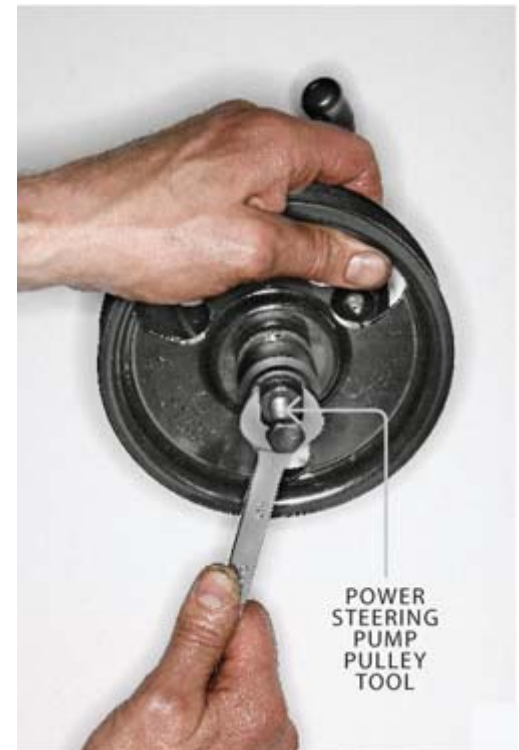


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A rubber low-pressure line had to be trimmed to break loose from fitting where rubber had gotten hard.

wheels just off the ground and with the engine idling--rotate the steering wheel from left stop to right stop a dozen times to burp excess air from the system. Recheck the fluid level in a couple of days.

Final step: Join a health club or gym to stay in shape because your car's power steering will no longer be your mobile Bowflex machine.



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A special tool will probably be necessary to press an old pump off the pulley and press a new pump on.



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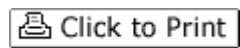
Top off reservoir, then bleed by turning wheel back and forth a dozen times with wheels off ground, engine idling.

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